MEASUREMENT: Attributes, Units, and Measurement Sense

Grade 4	Grade 5	Grade 6
Overall Expectation #1		
- Estimate, measure, and record length, perimeter, area, mass, capacity, volume, and elapsed time, using a variety of strategies	- Estimate, measure, and record perimeter, area, temperature change, and elapsed time, using a variety of strategies	- Estimate, measure, and record quantities, using the metric measurement system
Specific Expectations		
- Estimate, measure, and record length, height, and distance, using standard units (i.e., millimetre, centimetre, metre, kilometre)		- Demonstrate an understanding of the relationship between estimated and precise measurements, and determine and justify when each kind is appropriate
- Draw items using a ruler, given specific lengths in millimetres or centimetres		
- Estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest minute	- Estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest second	
- Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in five-minute intervals, hours, days, weeks, months, or years	- Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in minutes, hours, days, weeks, months, or years	
	- Measure and record temperatures to determine and represent temperature changes over time	
- Estimate, measure using a variety of tools and strategies, and record the perimeter and area of polygons	- Estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools	
- Estimate, measure, and record the mass of objects, using the standard units of the kilogram and the gram		- Estimate, measure, and record length, area, mass, capacity, and volume, using the metric measurement system
- Estimate, measure, and record the capacity of containers, using the standard units of the litre and the millilitre		
- Estimate, measure using concrete materials, and record volume, and relate volume to the space taken up by an object		

MEASUREMENT: Measurement Relationships

Grade 4	Grade 5	Grade 6
Overall Expectation #2		
- Determine the relationships among units and measurable attributes, including the area and perimeter of rectangles	- Determine the relationships among units and measurable attributes, including the area of a rectangle and the volume of a rectangular prism	- Determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism
Specific Expectations		
- Describe, through investigation, the relationship between various units of length (i.e., millimetre, centimetre, decimetre, metre, kilometre)	- Select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure length, height, width, and distance, and to measure the perimeter of various polygons	- Select and justify the appropriate metric unit (i.e., millimetre, centimetre, decimetre, metre, decametre, kilometre) to measure length or distance in a given real-life situation
- Select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure the side lengths and perimeters of various polygons		
	- Solve problems requiring conversion from metres to centimetres and from kilometres to metres	- Solve problems requiring conversion from larger to smaller metric units
		- Determine, using concrete materials, the relationship between units used to measure area (i.e., square centimetre, square metre), and apply the relationship to solve problems that involve conversions from square metres to square centimetres
- Determine, through investigation, the relationship between the side lengths of a rectangle and its perimeter and area	- Determine, through investigation using a variety of tools and strategies, the relationships between the length and width of a rectangle and its area and perimeter, and generalize to develop the formulas [i.e., *Area* = *length* x *width*; *Perimeter* = (2 x *length*) + (2 x *width*)];	- Determine, through investigation using a variety of tools and strategies, the relationship between the area of a rectangle and the areas of parallelograms and triangles, by decomposing and composing
		- Develop the formulas for the area of a parallelogram (i.e., *Area of parallelogram* = *base* x *height*) and the area of a triangle [i.e., *Area of triangle* = (*base* x *height*) ÷ 2], using the area relationships among rectangles, parallelograms, and triangles
- Pose and solve meaningful problems that require the ability to distinguish perimeter and area	- Solve problems requiring the estimation and calculation of perimeters and areas of rectangles	- Solve problems involving the estimation and calculation of the areas of triangles and the areas of parallelograms
- Compare and order a collection of objects, using standard units of mass (i.e., gram, kilogram) and/or capacity		

(i.e., millilitre, litre)		
- Determine, through investigation, the relationship between millilitres and litres		
- Determine, through investigation, the relationship between grams and kilograms	- Select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram, tonne)	
- Select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram) and the most appropriate standard unit to measure the capacity of a container (i.e., millilitre, litre)		
- Solve problems involving the relationship between years and decades, and between decades and centuries	- Solve problems involving the relationship between a 12-hour clock and a 24-hour clock	
- Compare, using a variety of tools, two-dimensional shapes that have the same perimeter or the same area	- Create, through investigation using a variety of tools and strategies, two-dimensional shapes with the same perimeter or the same area	- Construct a rectangle, a square, a triangle, and a parallelogram, using a variety of tools given the area and/or perimeter
	- Determine, through investigation using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism, and generalize to develop the formula (i.e., *Volume* = *area of base* x *height*)	determine, through investigation using a variety of tools and strategies the relationship between the height, the area of the base, and the volume of a triangular prism, and generalize to develop the formula (i.e., *Volume* = *area of base* x *height*)
		- Determine, through investigation using a variety of tools and strategies, the surface area of rectangular and triangular prisms
	- Determine, through investigation, the relationship between capacity (i.e., the amount a container can hold) and volume (i.e., the amount of space taken up by an object), by comparing the volume of an object with the amount of liquid it can contain or displace	
		- Solve problems involving the estimation and calculation of the surface area and volume of triangular and rectangular prisms